REMARKS:

Pursuant to 37 CFR 1.177(b), the original claims 1-19 have been canceled since these were examined in the parent reissue application.

The new claims 20-36 have been added and constitute the sole pending claims of the current reissue application. These claims include the independent claim 20 and its dependent claims 21-25, the independent claim 26 and its dependent claims 27-30 and the independent claim 31 and its dependent claim 32-36.

An explanation of the support in the disclosure of the patent for the changes made to the claims is provided herewith.

Support for Added Claims

The independent claim 20 and its dependent claims 21-25 are discussed first.

Claim 20 recites a method of operating a calcination plant for particulate material which involves the following steps:

A. Admitting the particulate material into a calcination zone peripherally surrounded by a peripheral wall.

B. Transporting the particulate material through at least part of the calcination zone along a substantially cyclonic flow path.

C. Adjusting the temperature in the calcination zone. The adjusting step includes varying the rate of admission of the particulate material into the calcination zone.

Claim 20 further specifies that at least part of the peripheral wall of the calcination zone is substantially free of ceramic.

Steps A and B find support in the following disclosure from column 5, lines 7-16 of the original patent:

"The reactor 14 consists of a high-temperature alloy, vertical pipe located inside the feed silo, operating at sufficiently high temperatures to calcine the feed material. The reaction zone may extend into the cyclone separator 20. As mentioned above, the feed material is discharged from the silo's storage compartment into the feed pipe 44 through rotary valves 30 and pneumatically conveyed tangentially into the calcining zone of the reactor 14, thus producing a cyclonic action that characterizes the flow of the fluidized reactants during calcination."

Support for Step C is present in column 5, lines 40-44 of the original patent as follows:

"It is recommended to control the reactor temperature by using the solid-particle feed rate, rather than gas rate, because control of the temperature using fuel-to-air ratios may lead to inefficient fuel consumption and unacceptable emissions."

Finally, the recitation in claim 20 that at least part of the peripheral wall of the calcination zone is substantially free of ceramic is supported by the following statement in column 6, lines 19-27 of the original patent:

> "Thus, the present invention provides a self-contained, energy-efficient system for calcining particulate feed material in a continuous operation that features high-temperature operating units (calcining reactor, cyclone, heat exchangers) located inside the raw material silo for insulation and preheating, which eliminates the need for refractory insulation, and a high level of energy recovery from the heat exchangers used to preheat the feed and the conveying air to the silo."

Claim 21, which specifies that the peripheral wall of the calcination zone is substantially free of ceramic along substantially all of the calcination zone, is likewise supported by the preceding statement in column 6, lines 19-27 of the original patent.

Claim 22 recites that the step of adjusting the temperature in the calcination zone is performed substantially exclusively by varying the rate of admission of the particulate material into the calcination zone. This claim finds support in the previous quote from column 5, lines 40-44 of the original patent.

Claim 23 states that the step of admitting the particulate material into the calcination zone comprises introducing the

particulate material into the calcination zone substantially tangentially of the calcination zone. Support for claim 23 is present in the disclosure which is found in column 5, lines 7-16 of the original patent and is referred to earlier.

Claim 24 recites the additional step of heating the interior of the cyclonic flow path. Such additional step is disclosed in column 3, lines 45-46 of the original patent where the following is stated:

"The burner 36 is mounted vertically in the calcining pipe to create an upward flame within the cyclonic feed region."

Claim 25 specifies that the heating step comprises directing a flame into the interior of the cyclonic flow path and this is again supported by the immediately preceding quote from column 3, lines 45-46 of the original patent.

The independent claim 26 and its dependent claims 27-30 will be discussed next.

Claim 26 is directed to a method of operating a calcination plant for particulate material which undergoes calcination at or above a calcination temperature. This method comprises the steps of:

A. Admitting the particulate material into a calcination zone.

B. Calcining the particulate material in the calcination zone to produce a solid calcined product mixed with gas.

C. Separating the solid calcined product from the gas in a solid-gas separation zone.

D. Maintaining at least the major part of the solid-gas separation zone at temperatures equal to or greater than the calcination temperature during at least the major part of the separating step.

Steps A and B of claim 26 are supported by the teachings referred to previously in connection with claim 20 and found in column 5, lines 7-16 of the original patent. For Step B, please see also the following statement in column 3, lines 57-60 of the original patent:

> "The reaction products out of the reactor 14 are classified in the cyclone 20, yielding a solid oxide product removed from the bottom of the unit through a rotary valve 22 and a hot gaseous product removed from the top."

This statement likewise supports Step C of claim 26.

Support for Step D of claim 26 can be found in column 5, lines 53-57 of the original patent. The disclosure here reads as follows:

"It is important to maintain calcination temperatures in the cyclone to avoid any adverse recarbonation of the solid oxide material prior to its separation from the combustion gases."

Claim 27 specifies that the particulate material undergoes calcination at a temperature of about 1700 degrees Fahrenheit or higher. This is supported by the following teaching in column 5, lines 15-18 of the original patent:

"In order for the decomposition reaction of limestone to take place, a reactor temperature of at least 1,700 degrees Fahrenheit must be maintained, possibly avoiding temperatures higher than 2,450 degrees Fahrenheit to prevent sintering."

Claim 28 recites that the temperatures in the calcination zone and the solid-gas separation zone are restricted to a maximum of about 2450 degrees Fahrenheit. Support for this claim can be found in the immediately preceding quote from column 5, lines 15-18 of the original patent.

Claim 29 specifies the additional step of transporting the particulate material through at least part of the calcination zone along a substantially cyclonic flow path. This claim is supported by the disclosure which was referred to earlier and is found in column 5, lines 7-16 of the original patent.

Claim 30 states that the particulate material is admitted into the calcination zone substantially tangentially of the

calcination zone. Please see again column 5, lines 7-16 of the original patent.

Finally, the independent claim 31 and its dependent claims 32-36 will be discussed.

Claim 31 recites a calcination plant for particulate material, and the plant comprises means defining a calcination zone and means for transporting particulate material through at least part of the calcination zone along a substantially cyclonic flow path.

Claim 31 goes on to recite that the means defining the calcination zone includes a peripheral wall which surrounds the calcination zone peripherally and that at least part of the peripheral wall is substantially free of ceramic.

Support for claim 31 is forthcoming from the previously quoted portions of the original patent in column 5, lines 7-16 and column 6, lines 19-27.

Claim 32 specifies a means for adjusting the temperature in the calcination zone by varying the rate of admission of particulate material into the calcination zone. This claim is supported by the teaching of the original patent referred to earlier and found in column 5, lines 40-44.

Claim 33 states that the peripheral wall of the calcination zone is substantially free of ceramic along substantially all of the calcination zone. Please see once more column 6, lines 19-27 of the original patent.

Claim 34 recites that the means for transporting particulate material along a substantially cyclonic flow path includes means for introducing the particulate material into the calcination zone substantially tangentially of the calcination zone. Support for claim 34 is present in the disclosure of the original patent quoted above and found in column 5, lines 7-16.

Claim 35 specifies a means for heating the interior of the cyclonic flow path. This claim is supported by the teaching in column 3, lines 45-46 of the original patent referred to previously.

Claim 36 states that the means for heating the interior of the cyclonic flow path comprises a burner for directing a flame into the interior of the cyclonic flow path. Please see again column 3, lines 45-46 of the original patent.

In accordance with 37 CFR 1.178(a), the original patent is being surrendered in the parent reissue application.

Besides the enclosed filing fee, no other fee is believed to be due with this application and amendment. Should there be any unforeseen costs, please charge our Deposit Account No. 17-0055.

Respectfully submitted,

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